An Examination of the Hail Detection Algorithm Over Central Alabama

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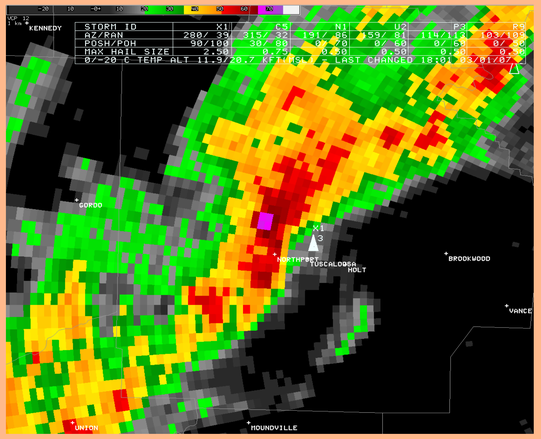
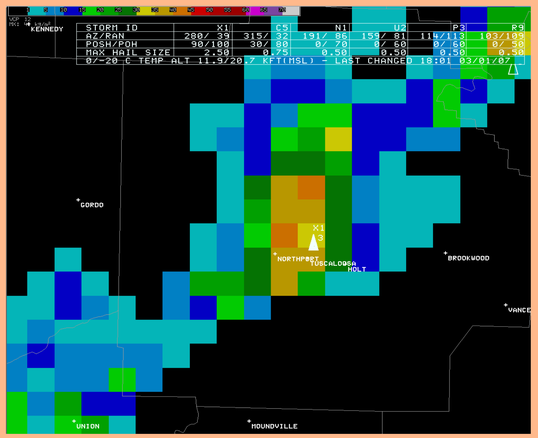


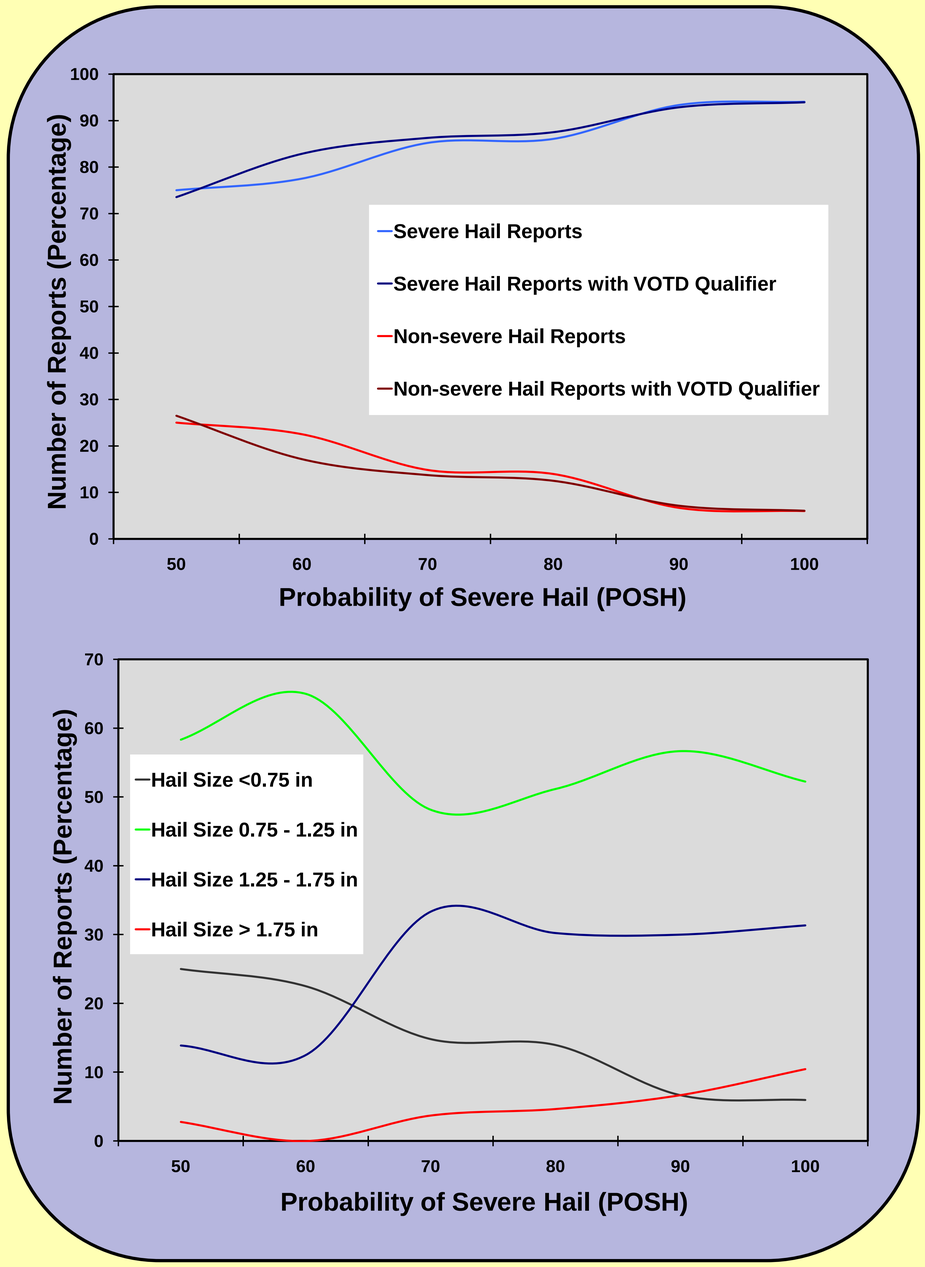


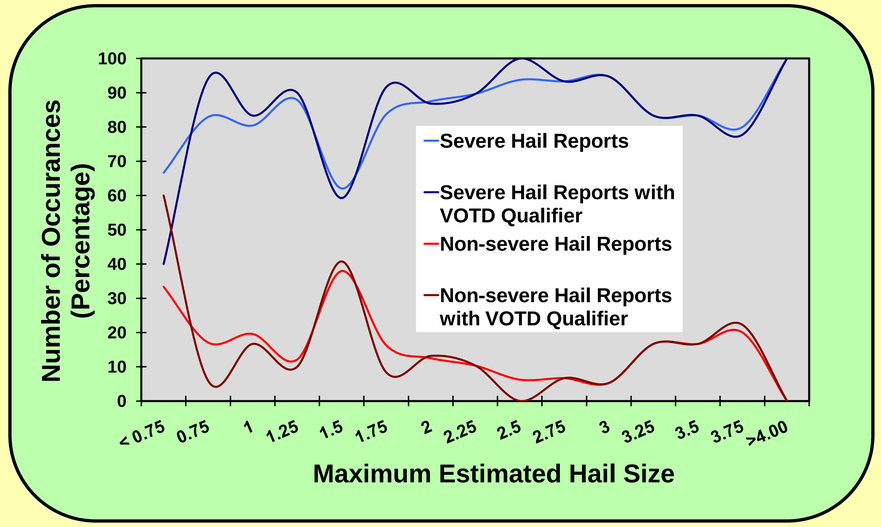
Date	Time UTC	Time CST	City	County	Magnitude	Lat	Lon	VIL	D-VIL
3/1/2007	22:44	4:44 PM	1E NORTHPORT	TUSCALOOSA	0.88	33.24	-87.57	40	80

POSH	POH	Max Hail Size	0 degree Height	-20 degree height	Environmental Update	T400 mb	T500 mb	VOTD	LI	CAPE	PW (mm)	PW (in)
90	100	2.5	11.9	20.7	18	21.9	10.7	46	-2.47	965	40.42	1.59

With the wide variety of decision tools available to forecasters for use during severe weather warning operations, the accuracy and reliability of certain products in the NWS Advanced Weather Interactive Processing System (AWIPS) are often questioned. The hail detection algorithm (HDA; Witt et al., 1998) is one of these tools. Originally deployed along with the storm cell identification and tracking algorithm (SCIT; Johnson et al., 1998), the HDA uses the vertical profile of reflectivity created by the SCIT to determine the hail potential of a cell-based thunderstorm. The HDA algorithm output provides the warning meteorologist with three parameters: the maximum estimated hail size (MEHS), the probability of hail (POH) and the probability of severe hail (POSH). Though this algorithm has been employed for 10 years, the only study of its effectiveness in the southeastern United States was completed in 1998 and is specifically noted for its use along the immediate Gulf Coast (Lenning and Fuelberg, 1998).

The purpose of this paper is to assess the output of the HDA using a statistical comparison to storm data. This is accomplished by examining two things: first, a comparison of the HDA output to numerous hail reports followed by a second comparison of the traditionally used VOTD. This paper compares the two warning decision tools to 368 local storms reports (LSR) within the Birmingham, Alabama county warning area.





Hail Reports	Count	Percentage
Severe Hail Reports (> 0.75)	310	84%
Non-severe Hail Reports (< 0.75)	58	16%
Hail Reports with a POSH <= 40	**98**	
Severe	78	80%
Non Severe	20	20%
Hail Reports with a POSH = 50	**36**	
Severe	27	75%
Non Severe	9	25%
Hail Reports with a POSH = 60	**40**	
Severe	31	78%
Non Severe	9	22%
Hail Reports with a POSH = 70	**54**	
Severe	46	85%
Non Severe	8	15%
Hail Reports with a POSH = 80	**43**	
Severe	37	86%
Non Severe	6	14%
Hail Reports with a POSH = 90	**30**	
Severe	28	93%
Non Severe	2	7%
Hail Reports with a POSH = 100	**67**	
Severe	63	94%
Non Severe	4	6%

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